

Introducing the NASA observatory designed to explore everything from our outer solar system to the edge of the observable universe, including planets throughout our galaxy and dark energy.

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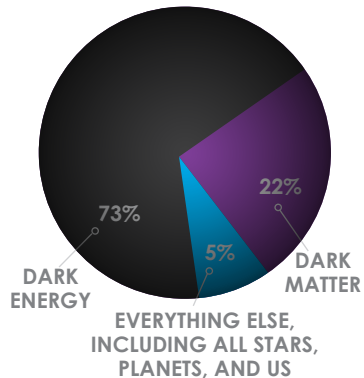
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THE NANCY GRACE ROMAN SPACE TELESCOPE

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The Nancy Grace Roman Space Telescope is a next-generation observatory that will survey the infrared universe from beyond the orbit of the Moon. The mission will feature a primary mirror that is 7.9 feet (2.4 meters) across – the same size as the Hubble Space Telescope's. The primary mirror, in concert with other optics, will send light to Roman's two science instruments – the Wide Field Instrument and Coronagraph technology demonstration.

The mission is designed to help astronomers explore many areas of astrophysics, including dark energy and exoplanets – planets beyond our solar system. Launching no later than May 2027, Roman will map stars, galaxies, and dark matter to explore the formation and evolution of large cosmic structures, like galaxies and galaxy clusters. Providing the same crisp resolution as Hubble but a field of view at least 100 times larger, Roman will conduct sweeping cosmic surveys that would take hundreds of years using Hubble. Scientists will use these surveys to help us better understand the universe and our place within it.



What is dark energy?

Astronomers have discovered that the expansion of the universe is speeding up. But the cause for this acceleration is not well understood. Roman will use multiple methods to explore whether a mysterious cosmic pressure, which we call "dark energy," is responsible.

How will it study exoplanets?

The Roman Space Telescope will hunt for planets using a quirk of gravity called microlensing. When two stars closely align from our vantage point, the nearer star – and orbiting planets – can lens light from the farther star. Using this method, Roman will fill a gap in our catalog of known worlds by finding planets like those in our solar system. The mission will also directly image exoplanets by using the Coronagraph to block out the glare from stars, revealing much fainter planets orbiting them. This will demonstrate the technology that will enable future missions to observe and characterize rocky, potentially habitable worlds.

How will it study cosmic mysteries?

Scientists will create a 3D map of the universe to help us understand how the cosmos grew over time under the influence of dark energy. The mission will also measure the shapes and distances of millions of galaxies and galaxy clusters to probe the distribution of both normal matter and dark matter – another dark cosmic mystery, visible only through its gravitational effects on matter we can see.



The Nancy Grace Roman Space Telescope is managed at NASA's Goddard Space Flight Center in Greenbelt, Maryland, with participation by NASA's Jet Propulsion Laboratory and Caltech/IPAC in Southern California, the Space Telescope Science Institute in Baltimore, and a science team comprising of scientists from various research institutions. The primary industrial partners are Ball Aerospace and Technologies Corporation in Boulder, Colorado, L3Harris Technologies in Melbourne, Florida, and Teledyne Imaging Sensors in Camarillo, California.

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